WHAT IS CLAIMED IS:

1. A control device for an internal combustion engine installed in a vehicle, comprising:

a flow rate sensor for measuring fresh air flow rate in an intake air passage connected to a combustion chamber of the internal combustion engine;

an air charge amount calculation module for calculating air charge amount to the combustion chamber according to a calculation model that includes as parameters measurement by the flow rate sensor and pressure within the intake air passage;

a pressure sensor for measuring pressure within the intake air passage; and

a correction execution module for correcting the calculation model based on measurement by the flow rate sensor and measurement by the pressure sensor.

2. A control device according to Claim 1, wherein

the calculation model is a model that estimates pressure within the intake air passage based on an output signal of the flow rate sensor, and utilizes the estimated pressure to calculate air charge amount to the combustion chamber, and

the correction execution module executes correction of the calculation model so that the estimated pressure and pressure measured by the pressure sensor coincide.

3. A control device according to Claim 2, wherein

the internal combustion engine comprises a variable valve mechanism enabling modification of flow passage resistance at a location of an intake valve by means of changing a working angle of the intake valve, and

relationships of pressure within the intake air passage to the air charge amount in the computation model are established with reference to operating

conditions specified in terms of a plurality of operating parameters that include the working angle of the intake valve.

4. A control device according to Claim 3, wherein

the correction execution module, by means of executing correction of the calculation model, compensates for error concerning relationship between size of the working angle of the intake valve and flow passage resistance at the intake valve location.

5. A control device according to any of Claims 1 to 4, further comprising:

a fuel feed controller for controlling a feed amount of fuel flowing into the combustion chamber; and

an air-fuel ratio sensor disposed on an exhaust passage connected to the combustion chamber,

wherein the correction execution module is able to correct the flow rate sensor according to a measured air-fuel ratio so that the measured air-fuel ratio measured by the air-fuel ratio sensor, the fuel feed amount established by the fuel feed controller, and the air charge amount determined based on the output signal of the flow rate sensor are consistent with one another, and correction of the calculation model is executed after correction of the flow rate sensor.

6. A control device according to any of Claims 1 to 5, wherein

the correction execution module executes the correction during a period in which revolution and load of the internal combustion engine are substantially constant.

7. A method for calculating air charge amount in an internal combustion engine installed in a vehicle, comprising:

(a) providing a flow rate sensor for measuring fresh air flow rate in an intake air passage connected to a combustion chamber of the internal

combustion engine, and a pressure sensor for measuring pressure within the intake air passage;

(b) calculating air charge amount to the combustion chamber according to a calculation model that includes as parameters measurement by the flow rate sensor and pressure within the intake air passage; and

(c) correcting the calculation model based on measurement by the flow rate sensor and measurement by the pressure sensor.

8. A method according to Claim 7, wherein

the calculation model is a model that estimates pressure within the intake air passage based on an output signal of the flow rate sensor, and utilizes the estimated pressure to calculate air charge amount to the combustion chamber, and

the step (c) includes a step of executing correction of the calculation model so that the estimated pressure and pressure measured by the pressure sensor coincide.

9. A method according to Claim 8 wherein

the internal combustion engine comprises a variable valve mechanism enabling modification of flow passage resistance at a location of an intake valve by means of changing a working angle of the intake valve, and

relationships of pressure within the intake air passage to the air charge amount in the computation model are established with reference to operating conditions specified in terms of a plurality of operating parameters that include the working angle of the intake valve.

10. A method according to Claim 9 wherein

the step (c) includes compensating for error concerning relationship between size of the working angle of the intake valve and flow passage resistance at the intake valve location, by means of executing correction of the calculation model.

11. A method according to any of Claims 7 to 10 wherein

the internal combustion engine further comprises:

a fuel feed controller for controlling a feed amount of fuel flowing into the combustion chamber; and

an air-fuel ratio sensor disposed on an exhaust passage connected to the combustion chamber,

wherein the step (c) includes the steps of:

correcting the flow rate sensor according to a measured air-fuel ratio so that the measured air-fuel ratio measured by the air-fuel ratio sensor, the fuel feed amount established by the fuel feed controller, and the air charge amount determined based on the output signal of the flow rate sensor are consistent with one another; and

executing correction of the calculation model after correction of the flow rate sensor.

12. A method according to any of Claims 7 to 11 wherein

the correction in the step (c) is executed during a period in which revolution and load of the internal combustion engine are substantially constant.